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need to perform the following database access operations at databases maintained by various different service providers:

  check credit databases owned by credit card companies or phone companies to determine whether the user is able to pay for the service;

  check the customer profile database in the user's HLR to determine whether the user is currently located in a place other than the visiting location currently stored in the HLR;

  check the credit and network databases of long distance phone companies specified by the user to determine whether the user can use a particular long distance carrier in the visiting location;

  load profile data into the VLR at the visiting location and update the HLR with the location of the VLR if necessary; and

  load the profile data to the call processing systems and activate the service.

The user may need to send or receive messages from any or all of the messaging options described above at a visiting location. That is, the user may want to receive or receive notification of e-mail, faxes, phone calls, or voice mail at a visiting location or to send e-mail or faxes from a wireless terminal. The need to integrate these various types of messaging options and to interconnect the many service providers has, until now, been largely unaddressed.

It is also desirable for the mobile employee to be able to limit the messages sent to the wireless messaging equipment, so that only urgent messages are received when away from the office and unwanted in-coming calls are avoided. The mobile employee may also wish to route certain incoming wireless messages and phone calls to other destinations, such as an office fax machine or a colleague's telephone.

Therefore, it is an object of the present invention to provide a mobile service subscriber the ability to remotely control the addressability, routing, accessibility, and delivery of messaging options.

It is another object of the present invention to provide an internetwork which interconnects messaging services with both wireless and wireline networks.

It is yet a further object of the invention to provide a control over the messages routed to wireless messaging options.

SUMMARY OF THE INVENTION

These objects are obtained by a personal communications internetwork providing a network subscriber with the ability to remotely control the receipt and delivery of wireless and wireline electronic text ("e-mail") messages. The network operates as an interface between wireless and wireline networks. The subscriber's message receipt and delivery options are maintained in a database which the subscriber may access by wireless or wireline communications to update the options programmed in the database.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and features of the invention will become apparent from the following drawings, wherein:

FIG. 1, 2, and 3 are overviews of the PCI networks;

FIG. 4 is an overview of one node of the PCI network according to the present invention;

FIG. 5 is a block diagram of an exemplary PCI server according to the present invention;

FIG. 6 is a block diagram of an exemplary embodiment of a PCI database according to the present invention;

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FIG. 7 is a block diagram of the logical connections between the PCI server and PCI database according to the present invention;

FIGS. 8, 9, and 10 illustrate exemplary message flows between a server and a database according to the present invention;

FIG. 11 is a block diagram of a personal digital assistant according to the present invention;

FIGS. 12, 13, 14, 15a, 15b, 16, 17, 18a and 18b illustrate exemplary message flows between a PDA and PCI server;

FIG. 19 is a block diagram of a text messaging portion of a PCI network;

FIGS. 20, 21, and 22 illustrate exemplary message flows in the PCI network; and

FIGS. 23, 24, 25, 26, 27, 28, 29, and 30 illustrate exemplary screens displayed to a PCI subscriber using a wireless PDA.

DETAILED DESCRIPTIONS OF PREFERRED EMBODIMENTS

For clarity of presentation, the detailed description is set out in the following subsections:

I. PCI Overview

The overall network is illustrated in FIGS. 1–4 The network is an interface between a plurality of wireless and wireline networks, providing a subscriber with a variety of wireless and wireline message and voice delivery and receipt options.

II. The PCI Server

The PCI Server is illustrated in FIG. 5. The PCI server is a peripheral which performs messaging and call redirection functions and interfaces with the PCI database to update the subscriber profile.

III. The PCI Database

The PCI Database is illustrated in FIG. 6. The PCI database maintains the subscriber profile, controls CallCommand functions, and handles DTMF-based subscriber profile updates.

IV. The Server/Database Interface

The Server/Database interface is illustrated in FIGS. 7–10. The PCI server/PCI database interface provides for the transfer of information regarding the subscriber profile.

V. The PDA/PCI Interface

The PDA/PCI interface is illustrated in FIGS. 11–18. The PDA/PCI interface provides for the transfer of information between a remote wireless subscriber and the PCI.

VI. E-mail Messaging Services

E-mail messaging is the PCI in illustrated in FIG. 19. The PCI network provides the subscriber with a variety of e-mail delivery, receipt, and notification options, including screening and selective destination delivery of incoming e-mail.

VII. Message Flows

Certain message flows for wireless messaging in the PCI are illustrated in FIGS. 20–22. The three message flows illustrated are sending a message from one subscriber to another, receiving a message regardless of whether the subscriber is using a wireless or wireline terminal, and sending a message to a non-subscriber.

VIII. The PDA Application

The application residing in the PDA is described in FIGS. 23–30, which illustrate exemplary screens displayed to a PCI subscriber using a wireless PDA.

IX. Billing

Billing procedures for a PCI network use is briefly described.